On the future of music research

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Published 16 December 2021; https://doi.org/10.18061/FDMC.2021.0002
Author video presentation and/or other conference material: https://doi.org/10.17605/OSF.IO/BGD8Q

Abstract

Several observations are made regarding the state of music research. An extended list of research questions is presented and *descriptive, hermeneutic, explanatory,* and *poetic* approaches to arts scholarship distinguished. It is proposed that a valuable area for future research is policy-related scholarship, especially research oriented toward advancing the public interest in cultural matters. While the goals of public/applied musicology are endorsed, attention is drawn to the risks of relying on practices that are not evidence based. The critical role played by explanatory research as an agent of change is highlighted. At the same time, doubts are expressed regarding the potential for music to precipitate major political transformation. It is suggested that corpus studies offer a promising future research avenue. Multi-measure research methods are endorsed and an integrated bio-psycho-socio-cultural approach to musical understanding is advocated. Public questions and answers follow.[1]

KEYWORDS: *music research, motivating questions, applied musicology, music and politics, music science, cultural policy*

Introduction

Over the centuries, music has become an increasingly prominent part of people's lives. I don't need to show you data in order to convince you that people today listen to much more music than was the case, say, two or three hundred years ago. But it's not just the case that people engage music more often than in the past. It's also the case that people engage in *talking* and *writing* about music much more than in the past.

Figure 1 traces the frequencies of the words "music" and "musique" as they appear in English and French language books since 1700. What's important to understand here is that these graphs don't simply indicate that there has been more published material concerning music over time. That's pretty much true of every topic. The graphs show the *relative* appearance of the words "music" and "musique" in published books over a three-hundred year period. That is, music has become proportionally much more important as a topic for writers over the past three centuries.

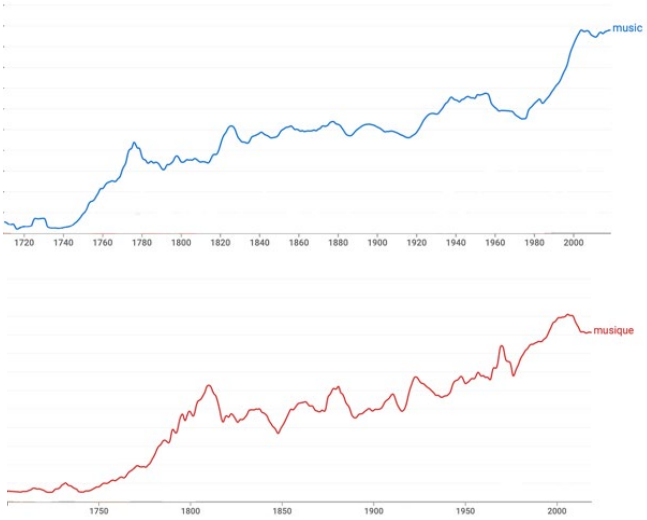

Figure 1: Relative frequencies of appearance for the words "music" and "musique" in English and French texts (Google ngram).

Figure 2 shows the notable prominence of this musical enthusiasm compared with other human passions like sports, movies, television, dance, theater, and the internet:

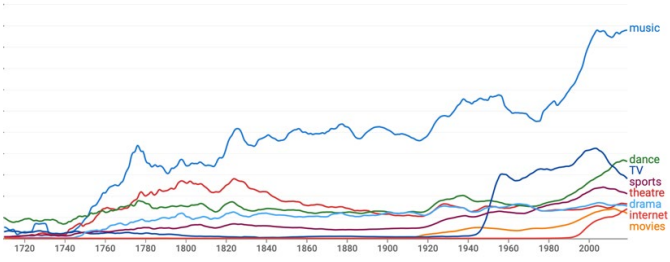

Figure 2: Comparison of relative frequencies for various entertainment-related words in English texts from 1700 to present.

I think what this testifies to is that, it's not simply the case that music-making and listening has become an increasingly prominent activity in people's lives, but that people are interested in learning and talking about

music; that is, people are much more engaged in ideas about music. Like the music itself, there are pleasures to be had from simply reading about, thinking about, and discussing music.

There are lots of different ways we can talk about music: we talk about our musical likes and dislikes; we gossip about our favorite musicians; we read biographies and pedagogical works on music. And there are plenty of philosophical discussions and speculations. It is this propensity to talk about music where music research fits in. Research contributes an important part to the thoughts and conversations we have about music.

Of course, research doesn't merely provide compelling stories about music. It also can have practical utility. At its best, research can help us solve problems, can offer new insights into how music works its wonders, suggest alternative approaches to music and music-making, and potentially point to possible unexplored musical realms—that is, novel regions of musical expression that have yet to be investigated by creative artists.

As musicians and music scholars, we surely want music to thrive—to be all that it can be. We want to promote and extend music to serve human well-being in as many ways as music is capable of doing that.

What we can predict about the future of music research is that researchers will surely explore all the ways in which sounds can be compelling to human minds. And we might further expect that, except insofar as people have only limited leisure time, the disposition to write and talk about music will continue well into the future.

Types of Arts Research

Of course, there are different types of research. Research is inherently an open-ended enterprise, so any effort to create a taxonomy of research is necessarily suspect. Nevertheless, broadly speaking, we might distinguish at least four approaches to arts scholarship, which I will refer to as *descriptive, hermeneutic, explanatory*, and *poetic*.

Descriptive Scholarship aims to describe some practice, work, or culture without offering any interpretation. Examples of descriptive scholarship are readily found in music history, music theory, and ethnomusicology. For example, much historical research is descriptive—as when a biography simply chronicles the events in a musician's life. Many music analyses are also descriptive, as when a roman numeral analysis identifies a sequence of harmonic events. And the simplest ethnography might, for example, provide a detailed description of a ritual or performance without necessarily offering any interpretation other than to report or relay the interpretations given by the people involved. Descriptive scholarship also includes first-person or phenomenological reports of the writer's subjective experiences.

Hermeneutic Scholarship, by contrast, aims to *interpret* some practice, work, or culture. Traditionally, hermeneutic scholarship aimed to decode or decipher the meaning of some text, such as attempting to clarify what an author might have meant by a particular passage (Zimmermann, 2015). An ethnography moves from descriptive to hermeneutic when the researcher proposes some novel interpretation that differs or augments what the people involved might say. It's common in musicology to offer hermeneutic interpretations of musical works, such as Susan McClary's famously controversial interpretation of a passage from Beethoven's ninth symphony as a representation or manifestation of sexual violence (McClary, 1987). Hermeneutic scholarship might also involve practical suggestions regarding how to perform or interpret a given work or passage.

Explanatory Research might be considered a special type of hermeneutic scholarship. Like hermeneutic scholarship, explanatory research has the aim of interpreting some phenomenon. However, explanatory research focuses exclusively on causal interpretations. The goal is to provide an account of *how* and *why* something occurs. Explanatory scholarship might propose why a particular work is organized the way it is, why listeners respond the way they do, or why certain practices, tendencies, or dispositions might be observed. The narratives are restricted to plausible causal scenarios or accounts.

Finally, there's what might be called *Poetic Scholarship*. This form of scholarship is unique to the arts and is not found in the sciences. It's imaginative scholarship that offers a creative response to some phenomenon.

An example of poetic scholarship would be Robert Schumann's programmatic stories describing Chopin's music through the imaginary characters of Florestan and Eusebius. But there's plenty of formal music analysis that fits into this category as in what David Temperley has referred to as "suggestive" analysis (Temperley, 1999). The scholarship may suggest how a work, performance, or experience might be approached or interpreted, without implying that this is the only way,

the right way, a better way, a useful way, or even a beautiful way. (By contrast, hermeneutic suggestions for performance assume that some interpretations are better than others.)

Poetic scholarship is itself best viewed as art: it's art in response to art. The artist-scholar responds to some phenomenon by creating another work of imagination. Poetic scholarship differs from descriptive, hermeneutic and explanatory research in that it makes no knowledge claims. For example, poetic scholarship differs from introspective description in that there is no implied claim that the description is accurate or representative of one's experience. We appreciate poetic scholarship, not according to its truth claims, but by such criteria as enjoyment, novelty, inventiveness, interest, beauty, and humor. Poetic scholarship is assessed largely exempt from criticism. One might claim, for example, that a work of poetic scholarship is not in the spirit of the original phenomenon; however, such criticism implies evaluating the scholarship from a hermeneutic perspective.

In all four approaches to arts scholarship, researchers commonly hope that the resulting scholarship will enhance our appreciation of a practice, work, performance, or culture.

Motivating Questions

For me, the best research starts with questions. I often set my students the following task: If you were granted an audience with God, and could ask anything at all, what would you want to know about music? It's worth spending a minute or two to consider some music related questions.

1. Why do people make music?
2. Does music-making contribute to human survival in some way?
3. Do non-human animals make or enjoy "music"?
4. Why doesn't every culture in the world have similar music?
5. Why are some people more musical than others?
6. What are the elements of musical ability?
7. Is musical "intelligence" independent of general intelligence?
8. Can we predict which children are likely to be most musically gifted?
9. Why are some people "tone-deaf?"
10. Can something be done to alleviate tone-deafness?
11. Is there something wrong with people who don't like music?
12. How does music give pleasure?
13. Why does the sound of fingernails scratching a blackboard sound so bad?
14. What makes certain sonorities or chords sound more pleasant than others?
15. Why does "rubato" exist—why isn't music played strictly according to the notated timing?
16. What makes some interpretations of a work sound better than others?
17. Does everyone "hear" music the same way?
18. How do children experience music differently from adults?
19. How does our musical "hearing" change as we grow-up and grow old?
20. Are there different ways of "listening?"
21. With training or effort, how differently might we be able to hear music?
22. Why do people disagree about musical likes and dislikes?
23. What makes us actively hate some songs?
24. Why do our musical preferences sometimes change over time?
25. Are musical preferences related to personality?
26. What does a person's musical tastes say about them?
27. How and why do musical styles change?
28. To what extent can we hear or understand the music of another culture in the same way as people from that culture do?
29. How do musical canons form?
30. Do we need to have a musical canon?
31. Why do we need so much music and so much musical variety—why don't we limit our listening to just a dozen of our favorite works?
32. How does repeated listening to a work change our experience of it?
33. What is the origin of various compositional rules, such as the rules of "voice-leading?"
34. What is the relationship between music and speech or language?
35. What is the relationship between music and movement or dance?
36. Why do some melodies get stuck in your head?
37. Why don't all melodies get stuck in your head?
38. What goes on when we imagine music?
39. What makes something sound sad or happy? Angry, cute, disgusting, tender, devotional, aggressive, exciting, powerful?
40. How does music evoke emotions in listeners?

41. Are there some emotions that can't be evoked by music—such as shame or guilt?
42. Why does some music make us nostalgic?
43. Why do people willingly listen to music that makes them report feeling sad?
44. Why do musicians have to practice so much?
45. Is there a better way to practice?
46. What is the best way to teach music?
47. Is there anything that can be done to lessen or avoid stage fright?
48. How are groups of performers able to coordinate their activities?
49. How is it that some musicians are able to improvise?
50. Why does some music make people want to dance? Why doesn't music make people want to cook, work in the garden, or go swimming?
51. Why do most people prefer tonal music to atonal music?
52. What is tonality anyway?
53. Why is it easy to drive a car and listen to loud music at the same time, yet it is often difficult to solve math problems and listen to loud music?
54. Can music "heal" people?
55. Can listening to music make you smarter?
56. Can music somehow corrupt or enhance moral behavior?
57. Can the music you listen to influence your political views? If so, how?
58. Is background music bad for you?
59. Can a person listen to too much music?
60. Does the complete absence of music have a detrimental effect on people?
61. Why are some people more enthusiastic about music than others?
62. What makes a good musical culture?
63. How can economies be organized so as to facilitate musical employment?
64. How do we engage the music of other cultures without being inadvertently exploitive?
65. Does our personal physiology affect our experience of music?
66. How does illness or physiological abnormality influence musical experience?
67. How can certain drugs enhance or detract from musical pleasure?
68. Are there brain structures specialized for just music?
69. What makes something "musical?"
70. Are there limits to what music could be?

Of course, there are many more questions that could be added to this list, and I'm sure readers will have their own pet questions that should be added. Although we have provisional answers for some of these questions, these are early days, and the questions themselves remind us of just how little we know at this point.

The Importance of Causal Research

What I think is important to understand is that there are real and pressing questions related to music. Questions like music's capacity for well-being, and questions of how to approach the music of another culture—these are questions that warrant careful consideration and sustained efforts to find good answers.

Ideally, research helps us change the world for the better. Of course, much change occurs by happenstance—without us having any say or influence. It would certainly be preferable if we had some choice in the matter. If we want to achieve some preferred state, it would be helpful to know what actions will make that happen. It would also be helpful to know what other actions might impede our goal, and what actions look useful, but aren't. In short, if we want to change the world, then we need to understand how change happens. We need to know that doing *X* will likely result in *Y*, or that doing *X* will have no effect on achieving *Y*. Of the four types of scholarship I've identified, the one that gives us the best tools for change is explanatory research—the scholarly approach that delves into causes.

Let me say that again: If we want to change the world for the better, the most useful research is research that identifies causes, and that's explanatory research. Sadly, explanatory research is the hardest to do. In the case of historical scholarship, we have no good causal methods. Identifying the causes of past historical events is necessarily correlational and so always speculative. Even in the sciences, a large proportion of the research is correlational rather than experimental. Moreover, when beginning an investigation, it's generally wise to cast a wide net, so descriptive and hermeneutic approaches offer good exploratory approaches for getting started.

Multi-Measure Research

In conducting explanatory research, we need to have good intuitions about the source of the causation. Is the phenomenon caused principally by a person's cultural background? Or is the main cause personality? Might

there be some sort of genetic component (Harden, 2021)?

We have no hope of identifying possible causal factors unless we're measuring the right variables. However, what people measure is commonly determined by their disciplinary backgrounds. If you work in an EEG lab, then you're going to measure EEG. If you're an ethnomusicologist working in the field, then what you collect will surely be ethnographic descriptions. The cliché here is that for the person who has a hammer, all the world looks like a nail. As researchers, we tend to rely on the same descriptive methods or the same dependent measures over and over again.

In 2012, I happened to attend a meeting of ethologists at Hunter College in New York City. Ethologists study animal behavior, and I watched presentation after presentation in which researchers discussed their work investigating the behavior of some particular animal. What struck me was the multiple methods used. Here's a presentation on some chinchilla behavior: here's the social behavioral data, and here's the brain-imagining data, and here's the genetic data. And now here's a presentation on gold finches: Here's the parenting behavioral data, and here's the hormonal assay data, and here's the brain-imagining data, and here's the genetic data. And so it went, for presentation after presentation.

Ultimately, I expect the future of empirical music research will follow this multi-measure approach. As the costs of various measurement methods become more affordable, music researchers will find it easier to embrace multi-measure methods. Imagine some future music conference where the presentations are of the following form: Here's this aspect of musical behavior. Here's the behavioral data, here's the socio-cultural, economic, and historical context, here's the personality data, here's the physiological data, here's the neuroimaging data, here's the genetic data, here's the proteomic data, and here's the introspective/ phenomenological report data from the participants. Once again, if we're not measuring the right things, we have no hope of identifying the locus of influence. In order to cast a wide net, we need to embrace multi-measure methods as the opportunities arise.

In conducting research, it's important not to view your disciplinary background as the source of some sort of allegiance. Think of your discipline as your limitation. If you think culture has little effect on how people experience music, I recommend reading Steven Feld's book on the Kaluli (Feld, 1990/2012)—or my book on expectation (Huron, 2006). If you think biology has little effect on how people experience music, try reading the literature on the effects of lysergic acid diethylamide (LSD)—or consider reading my book on voice leading (Huron, 2016). We now have excellent empirical evidence that musical experience is influenced by physiology, by psychology, by personality, by social context, and by enculturation. This means that there is only one proper approach to the study of music and that's an integrated *bio-psycho-socio-cultural* approach.

I think there are two immediate take-home messages from the promise of future multi-measure methods. First, always be prepared to learn and apply new measurement methods. And secondly, aim to collaborate with people who collect data that is contrasting or complementary to what you tend to do.

Corpus Studies

Of course, not all empirical research need focus on identifying causes. Nor should empirical research focus exclusively on how humans experience music. As already mentioned, the study of history is necessarily correlational. Moreover, most historical questions center on phenomena other than subjective human experience. From a traditional musicological perspective, I think a ripe area for research is the application of empirical methods to the study of music history. In particular, I think the future looks especially rosy for digital corpus studies. Let me offer three examples of how empirical methods have led to new insights regarding music history.

One of my favorite studies is a corpus study conducted by Matthias Mauch and colleagues from 2015 (Mauch, *et al.,* 2015). They used a technique devised by Jonathan Foote called "Foote Similarity" to examine stylistic changes in Western popular music (Foote, 1999, 2000).

Foote Similarity is simply a method for measuring similarity over time. In commercial applications it's used, for example, to identify discontinuities as a way of navigating through movies or audio recordings. Suppose you have an audio file containing a conversation between a man and a woman. You're looking for a particular point in the recording where the woman says something of special interest. Unfortunately, the recording is long, and its mostly dominated by the man talking. Instead of scanning forward through the file, playing bits and pieces of the conversation, it would be more convenient if you could use a "skip" button that would take you to the next

moment when the speaker changes—from man to woman, or from woman to man.

A simple point-by-point measure of the audio spectrum will pin-point places in the recording where there is a large change, and those points would typically be associated with moments when the speaker changes. You could apply the same method to have a skip button that would move you in a song between verse and chorus passages. In effect, what Foote Similariity provides is an automatic method for audio segmentation using a measure of sonic novelty.

Now instead of characterizing the changes in an audio track over several minutes or hours of music, suppose that you decide to characterize changes in music over a 50-year period. That's what Mauch and his colleagues did. They applied Foote Similarity measures to what-you-might-think-of as one very long music file consisting of (30-second excerpts from) 17,000 pop songs on the US charts, from 1960 to 2010. What this technique allows you to do is to identify moments in time where the music becomes significantly different from what existed before.

When calculating an audio spectrum, one consideration is the size of the analysis window used. In audio applications, we often employ windows whose sizes amount to a few milliseconds. Especially when the audio consists of many individual recordings, there's merit to using window sizes that are much longer than the songs themselves. In this case, we might consider window sizes as large as an entire year or more.

Figure 3 shows the results of their study. The horizontal axis represents time (from 1960 to 2010) whereas the vertical axis represents the window size (measured in years). Dark blue here means high similarity. Light blue, yellow, and red represent periods where the music becomes increasingly different from what came before. As the window size increases you can see that there emerge particular years in which notable discontinuities appear—that is, where the music changes noticeably. The three most prominent discontinuities coincide with the years 1964, 1983, and 1991.

If you're a popular American music scholar, you would surely be able to label these particular changes: 1964 is associated with the so-called British Invasion, with the popularity of groups like the Beatles and the Rolling Stones. 1983 is associated with the introduction of New Wave and Hard Rock, and 1991 is associated with the introduction of Rap and Hip Hop.

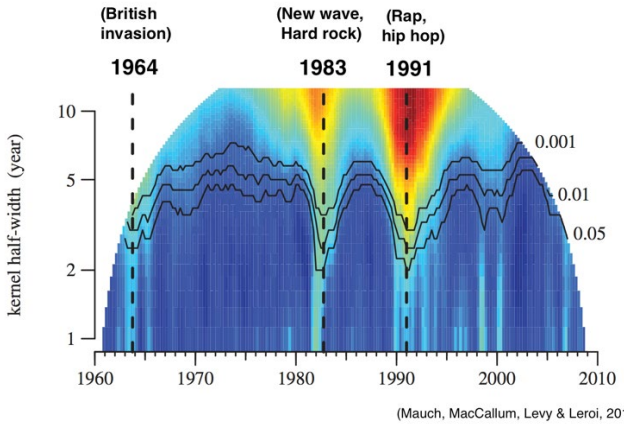

Figure 3: Sonic discontinuities by date of release for 17,000 pop songs appearing on US charts from 1960 to 2010, measured using Foote Similarity. Reproduced from Mauch, et al., 2015.

Stylistic Change

Now apart from identifying moments of historical change, corpus studies can also tell us something about the nature of the stylistic changes. An example is a study I conducted with Katlyn Horn where we assembled a large random sample of Western art music spanning a one-and-a-half century period from 1750 to 1900 (Horn & Huron, 2015).

For each sample passage we coded just four pieces of information: the tempo, the dynamic level, the mode (major or minor), and the predominant articulation—from predominantly staccato to predominantly legato. We then conducted cluster analyses for each of three successive 50-year periods. For each cluster type, we provided a descriptive label. For example, the combination of loud/major/fast/staccato we labeled 'joyful' passages. The combination of quiet/major/slow/legato, we labeled 'tender lyrical.' What we called 'sad-relaxed' passages were quiet/minor/slow/legato, and what we called 'light-effervescent' passages were quiet/major/fast/staccato. Our aim was to determine what combinations of musical features tend to predominate, and whether the different types of passages tend to change over time.

Figure 4 shows the resulting cluster analysis for the entire 150-year period. The vast majority of passages can be classified as falling into just eight categories: joyful, regal, tender-lyrical, light-effervescent, serious, passionate, sneaky, and sad-relaxed. (Incidentally, what we mean by 'sneaky' music are passages that are quiet, fast, staccato, and in the minor mode—think Grieg's *In the Hall of the Mountain King*.)

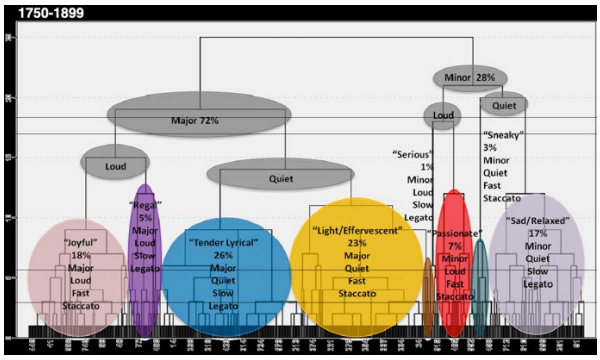

Figure 4: Cluster analysis for a random sample of musical passages of Western art music spanning the period 1750 to 1900. Reproduced from Horn & Huron, 2015.

What's interesting is how the proportions of these different types of passages change over time. For example, in the late 18th century (Figure 5), you can see that the most prominent category is 'light-effervescent' music (shown in yellow)—and representing nearly 40 percent of all sampled passages.

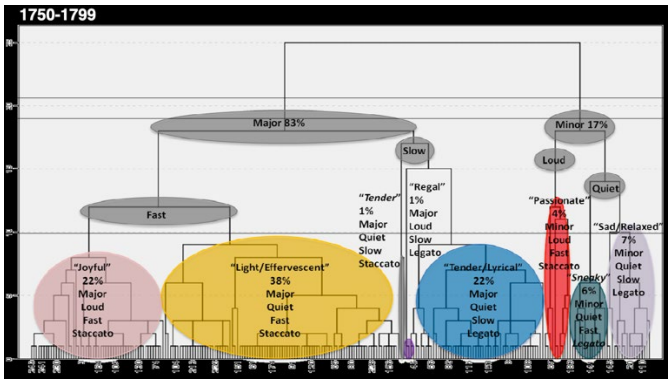

Figure 5: Cluster analysis for a random sample of musical passages of Western art music spanning the period 1750 to 1800. (Horn & Huron, 2015)

By the early 19th century (Figure 6), light-effervescent music is less than 30 percent.

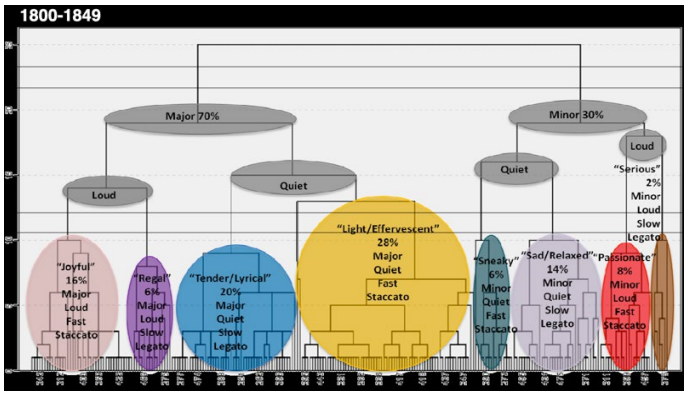

Figure 6: Cluster analysis for a random sample of musical passages of Western art music spanning the period 1800 to 1850. (Horn & Huron, 2015)

And by the last half of the 19th century (Figure 7), there simply weren't enough passages to result in an independent cluster. That is to say, light-effervescent passages nearly completely disappeared in our sample of Western art music.

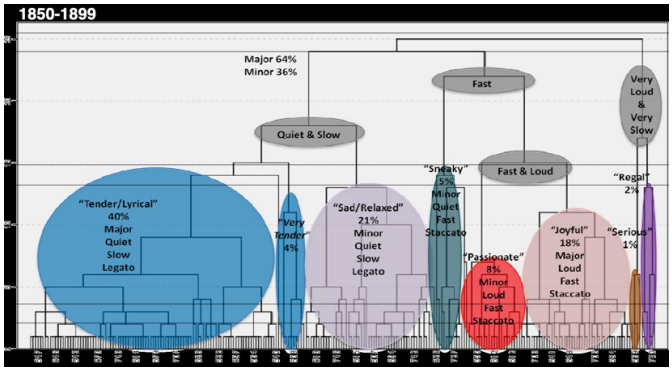

Figure 7: Cluster analysis for a random sample of musical passages of Western art music spanning the period 1850 to 1900. (Horn & Huron, 2015)

Figure 8 summarizes the changes over the 150-year period. Musical passages we might call 'tender-lyrical' expanded dramatically, especially in the last half of the 19th century, and represent almost half of the music we sampled. At the same time, 'sad-relaxed' music triples in size over the 150-year period. And finally, 'light-effervescent' passages, which predominate in the 18th century, virtually disappear by the end of the 19th century.

Proportion of Each Cluster in Each Epoch			
	1750-1790	**1800-1840**	**1850-1890**
Tender/Lyrical	22%	20%	44%
Light/Effervescent	38%	28%	0%
Joyful	22%	16%	18%
Regal	1%	6%	2%
Sad/Relaxed	7%	14%	21%
Passionate	4%	8%	8%
Sneaky	6%	6%	5%
Serious	0%	2%	1%

Figure 8: Comparison of relative proportions of different types of passages for three 50-year epochs from 1750 to 1900.

In general, we might say that music became less light-hearted or joyful and more solemn, serious, or passionate. The results are certainly consistent with how we generally think of late Romanticism.

Geography

Apart from how music changes over time, music also changes over space. There's a *geography* to music history, and especially interesting are those changes where musical ideas or patterns disperse over time.

Some years ago, Bret Aarden and I published a study where we mapped some 6,000 European folksongs. Bret spent the summer using an electronic gazetteer to resolve village place names into latitude and longitude values. That allowed us to use mapping software to create musical maps (Aarden & Huron, 2001).

Figure 9 shows an example of one of the maps we generated. This is a map showing the distribution of songs in the major and minor modes in western Europe. White regions represent areas where major-mode songs predominate whereas dark regions represent areas where the minor mode predominates.

Historical musicologists have long observed the tendency for musical innovations originating in Italy to slowly make their way north into northern Europe. One of these innovations was the major/minor system which developed in Italy around 1600. Prior to the major/minor system, the most common mode in European music was the Dorian mode—a mode that most resembles the modern minor rather than major mode. So the main evidence for the spread of the major/minor system is the increasing use of the major mode.

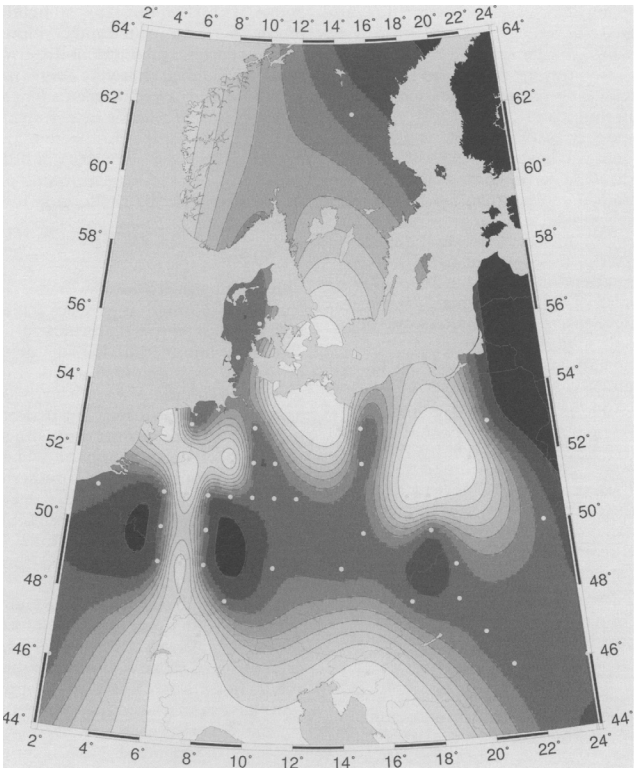

Figure 9: Geographical distribution showing the predominance of major mode (white) and minor mode (black) folksongs. (from Aarden & Huron, 2001)

These cultural dispersions happened long before the invention of railroads. They occurred during times when rivers were the main conveyors of people, goods, ideas – and of music. Mountains were especially formidable cultural barriers.

In particular, let me draw your attention to a white-colored north-south strip between Switzerland and the Netherlands. What's striking about this corridor is that it coincides almost perfectly with the Rhine River valley. It's consistent with the conjecture that the major mode dispersed north from Italy through the Rhine River corridor.

The right-most white region on our map similarly coincides nearly perfectly with the Vistula river valley in modern Poland. The Vistula flows through the major cities of Kraków and Warsaw, entering the Baltic Sea at Gdansk (German: Danzig), Poland's foremost port. In general, notice that white (major mode) regions tend to coincide with either river valleys or coastal areas. Evidently, the geographical spread of the major mode can still be observed in folksong repertoires hundreds of years later.

Certainly, more research is needed. This map represents merely a smoking gun. But it is suggestive, and the results imply that there may be much to learn from considering how musical features are distributed over geographical space.

The Promise of Corpus Research

As a group, I think these three studies illustrate the enormous potential and future promise for corpus studies. Big data offers opportunities to pinpoint musical changes in time and place, trace possible patterns of musical dispersion and influence, and identify the specific musical and stylistic features that are the main targets of musical change.

At some point in the future, someone is going to apply a technique like Foote Similarity measures to the entire history of documented music—not just Western music, but all music around the world for which we have historical records.

These techniques are going to give us much more refined insights into the kinds of changes music undergoes in different places and times. Moreover, bottom-up measures might even be tailored so that a measure of similarity itself (for example) might reflect what we know or conjecture about how people in different times or cultures might have perceived musical similarity. Techniques such as these offer a much more comprehensive approach to understanding the history of musical change.

Realism

As I mentioned earlier, one of the overarching aims of music research is to ultimately identify and explore all of the ways that music can contribute to human well-being. Of course, our dreams about what music might be able to achieve are not always realistic.

Public/Applied Musicology

Most recently, we might consider the exciting and inspiring initiatives known as public or applied musicology. Although initiated some decades ago, the applied musicology movement has gained considerable momentum in the past few years. Several specialty conferences have explicitly focused on applied musicology and special sessions on applied musicology are now routine at general music conferences.

The basic idea is for musicologists, ethnomusicologists, music theorists, and music scholars of all stripes to better serve the public, and improve the societies in which we live. The idea is to tear-down the town-and-gown barriers and better connect ivory-tower institutions to their local and regional communities.

In the case of musicology, proposals for public outreach include music journalism, organizing concerts and festivals, writing program notes, curating exhibits and public events, involvement with broadcast media, web design, repatriating indigenous musical knowledge, sponsoring or nurturing various performance troupes (especially from minority communities), and aiding in disaster recovery and other social and physical emergencies.

An example of public musicology is starting up a community choir among (say) Somali immigrants in order to enhance a sense of identity among the participants.

I think the aims of applied musicology are laudable. I think "Make the world a better place" is part of everyone's job description. Once again, our hope is surely to support every effort to use music to improve human well-being in as many ways as that's possible. But I do have concerns related to the more social service elements you find in the public musicology movement.

If we're considering Applied Musicology as a form of social service, then there is something to be said for looking at the experiences of those already involved in social services—most notably social workers. Social workers occupy the front lines. One would be hard-pressed to find a cadre of people more eager to improve the human condition, especially improving the lives of those among us who are less fortunate. Social workers are typically idealistic and eager to be the agents of positive change.

The history of social work, however, is spotty. Ideas, initiatives, and programs come and go. If there is one overarching lesson to be learned from the history of social services, it's that what we *think* might be a good idea, doesn't always pan-out. The history of social intervention is littered with ineffective programs.

Two well-known programs in the U.S. were the D.A.R.E. program whose aim was to reduce drug abuse, and the Scared Straight program which exposed juvenile delinquents to prisons as a way of scaring them away from future criminal activity. They were both popular programs that spread beyond the U.S. to other countries. The only problem was that long-term studies showed they didn't work.

The D.A.R.E. program had no effect on illegal drug use and actually increased alcohol and tobacco use among participants compared with matched at-risk kids who didn't participate in the program. And in long-term studies, participants in the Scared Straight program were

more likely to engage in future criminal activity compared with those juvenile delinquents who had been random assigned not to participate in the program.

What social workers understand is that although we can hold the very best of intentions, our intuitions are very often wrong. Of course, intuition is essential. When we're dealing with some problem, there often isn't pertinent research to draw on, and so we have no other option but to rely on our intuitions. Musicians certainly understand that, perhaps more than others.

But social workers have learned over and over again just how fallible our intuitions can be. What social workers have learned is that it's essential to maintain a healthy skepticism about the effectiveness of various programs and that you shouldn't introduce a program without a formal process in place for evaluating its effectiveness. In recruiting students to social work programs, it's not enough just to seek committed social or community activists. You need people who are skeptical of their own intuitions and who understand that good intentions can backfire. You need people who are careful thinkers and understand the importance of evidence-based practice.

Returning again to the example of starting a community choir among Somali immigrants, it's indeed very likely that the activity will contribute to a sense of identity among the participants. But research on group identity suggests that this will weaken their sense of belonging to larger groups, such as the feeling of being a resident of their host town or city, a feeling of kindship with other African immigrants, or feelings of being citizens of the world. So just what precisely is being accomplished?

I don't want to suggest that public musicology is misguided, or that we should leave social services to the professionals. When it comes to building better and more just lives, we need all the resources we can muster. What I'm saying is that we're headed for trouble if we don't take research seriously and just assume our good intentions and intuitions are sufficient.

It all hinges on understanding the effectiveness of what we're doing and that hinges on program assessment.

There is, of course, a lot of expertise that already exists for measuring program effectiveness. But let's not deceive ourselves: you won't find that expertise in music departments or conservatories. Social workers and other professionals won't be impressed by our amateur efforts and they will be exasperated that we'll be competing against them for scarce government and philanthropic support.

It looks like we're creating a generation of new arts graduates who regard themselves as social activists, but who are badly trained, and who won't initially realize the extent of their poor training.

Despite the good intentions, my reading of the applied or public musicology (and ethnomusicology) movements is that we're headed for failure if practitioners aren't properly trained in how to conduct best-practices assessment research.

We need to stop thinking in terms of good and bad people and think instead in terms of effective and ineffective practices. And that requires that we focus on research rather than focusing on moral judgments of others. My fear for the applied musicology movement is that we're headed for a repeat performance of the Mozart Effect blunder, only on a much larger scale.

Political Value of Music

Music has long been regarded as playing a major role in political transformation. Music has indeed figured prominently in many historical and current protest movements. But its capacity for political change is often over-exaggerated as in Lord Fletcher of Saltoun's famous claimed that "Were I able to make the ballads of a nation, I need not write its laws."

Lord Fletcher's statement is certainly poetic. But it is more optimistic than realistic. Music is important in people's lives, but it is unlikely that music holds the sort of dramatic political power that some music scholars often suppose.

Theodor Adorno believed in the politically transformative power of twelve-tone music: that living in the false age, serial music would hold up the false to the false (as he said) and so help to bring about revolutionary change. So just how much political impact can we attribute to Schoenberg, Webern, Berg, and their colleagues? Adorno proposed, for example, that if people had listened more carefully to music, the holocaust would have been avoided. Quoting the pertinent passage from Adorno, New Musicologist, Susan McClary noted approvingly, "So the stakes are enormous" (McClary, 2021).

Even in the case of popular music, there are grounds to be skeptical of common claims regarding its political influence. There is first of all the question of causality: does music lead or follow, and if it leads, does it compel in some way?

There's also the issue of relying on lyrics. There is more to music's influence than lyrics, but in political movements lyrics ostensibly play a critical role. However, the extant research shows that only about half

of music listeners even pay attention to sung lyrics (Condit-Schultz & Huron, 2015). For many people around the world, much of the popular music they hear is in a language they don't even understand. And, of course, that's long been the case for classical music.

If I were a multi-billionaire intent on using my wealth to bring about political change, I'm not really convinced that funneling money to musicians would be as effective or more effective than supporting individual politicians, writers, or media commentors.

Madeleine Albright was right that music is a useful "soft power" political tool. But so are banquets and gifts. Music offers a useful way to build bridges, but that's likely attributable to the pleasure it affords. Of course, music does have *some* political-ideological influence. But it's doubtful that it can effectively write a nation's laws or instigate a revolution.

In understanding the political value of music, once again, it's incumbent upon researchers to neither overestimate nor underestimate its effectiveness.

Cultural Policy

Let me offer an alternative suggestion regarding the goal of political change.

Universities house lots of different kinds of research. A notable class of research that we rarely hear about in the arts is *policy* research. If you visit other university departments, such as engineering, medicine, social work, education, environment, etc., you'll find many scholars who work explicitly on public policy issues. For example, in medicine you'll find researchers with expertise on public health policy. In economics, there are scholars who work on taxation policy and banking regulation. In computer science, there are faculty who worry about data security and privacy. In chemistry, there're people who are concerned about handling of toxic products and occupational safety. In agriculture, you'll find researchers intent on reconciling good environmental regulation with productive farming practices. In veterinary medicine, there are people who study policies related to animal welfare. In psychology, you'll find faculty who work on issues of clinical certification and therapeutic practice.

In education, law, geography, economics, urban planning, business, biology, and dozens of other departments, you'll find a proportion of scholars who spend their lives preparing for the moment when they can offer advice to legislators. If a government is contemplating revising laws or regulations related to welfare, or fisheries, or transportation, you'll find academics and academic organizations ready to travel to the seats of government and ready to submit carefully reasoned policy position papers. These policy scholars understand the legislative history; they are knowledgeable about the policies in other jurisdictions and countries, and they have followed the good, bad, and indifferent outcomes from various initiatives. They can point to unexpected repercussions of different regulatory approaches and they can provide useful advice intended to serve the public good.

Not so in the arts. In the arts, we have some scholars who engage in educational policy research. But I know of no music scholar engaged in cultural policy research.

At the moment, the Web is utterly transforming the way in which culture is created and disseminated, how cultural industries bring in income, how nonprofit organizations do fundraising, who holds power, how distribution is organized, how musicians make money, the role of amateurs, whether music distribution will become entirely subservient to advertising, and myriad other issues. Not since the invention of sound recording in the late 19th century has music been impacted the way it is now.

All over the world, countries are faced with legislative and regulatory challenges concerning intellectual property, cultural organizations, maintaining cultural identities in the face of globalization, repatriating intangible cultural artifacts, and many other challenges.

I'd like to suggest that the most important task for music scholars (and arts scholars in general) is to nurture and advance culture. In the same way that an agronomist can ask "What is good agricultural practice?" We can ask, "what makes a good musical culture?" And like the agronomist, we can then take practical steps to try to change the world for the better. There are surely many facets that define a vibrant and valuable musical culture. And part of what shapes culture is the legal and regulatory environment in which musical culture operates.

In October of 2018, the U.S. Music Modernization Act was signed into law. That law emerged from a battle between the two main commercial stakeholders, namely representatives of copyright owners and producers, and media conglomerates involved in music distribution. This year, 2021, saw the creation of the new music licensing collective which will act as a toll booth for companies like Spotify, Pandora Soundcloud, and other digital music providers. Once again, in formulating this legislation, the people around the table who thrashed out the agreements were the commercial groups with vested interests. According to public records and minutes of the

various meetings leading to the legislation, there apparently wasn't a single individual present representing the public interest.

The United States isn't alone in this. All over the world, we see this same scenario repeated. What policies will best serve the public? Alas, music scholars have virtually nothing to offer. I don't know of any policy expertise in music departments or conservatories.

I'd like to propose that an important area for future music-related research is in the domain of cultural policy. If we don't engage in public policy research related to arts and culture, then cultural policy will be shaped almost exclusively by commercial and industrial interests.

Cultural policy research would include both basic research as well as specific policy recommendations. Basic research on cultural values and cultural policy might focus on questions like the following:

1. What is the purpose of cultural preservation?
2. How do we maintain cultural traditions while ensuring creative freedom?
3. At what point does promoting a sense of cultural identity lead to cultural intolerance?
4. Is cultural policy something we should create *a priori*? Or should policy arise through a *laissez faire* process of benign neglect?
5. How do people express cultural preferences?
6. How can we infer the cultural values of some group of people?
7. In comparison to unpaid amateur music-making, what is the role of professional musicians in a vibrant musical culture?
8. How do we align the interests of commercial cultural industries with the public good?

This is only a sample of what is surely a long list of questions regarding musical and cultural values.

We need, I believe, to develop a cadre of music scholars with cultural policy expertise, who will act in the public interest, paying attention to the nurturing and development of musical culture in all its various manifestations. Once again, the aim is to serve human well-being in as many ways as music is capable of doing that.

Historically, social and political critique in the arts has tended to remain at an abstract and rhetorical level. What is needed, I propose, is concrete suggestions and evidence-based legislative recommendations.

Most music programs are funded through public taxes. We receive public support because our activities are thought to serve the public good. The ultimate stakeholders in these decisions, are not merely copyright holders and media conglomerates; the ultimate stakeholders are—all of us.

At the very moment when decisions are being made that will affect musical culture—possibly for the next several centuries—arts scholars appear to have nothing to contribute. Scholars in the law schools, in engineering, and business have thought more about the future of music than have musicians and music scholars.

Music Science

Empirical research in music has grown considerably in recent decades. Figure 10 shows a Google ngram graph for the relative frequency of occurrence for the phrases "music psychology" and "music cognition" since the end of the second world war.

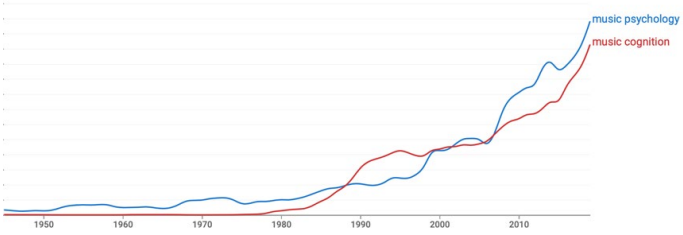

Figure 10: Relative frequencies for the phrases "music psychology" and "music cognition" in English texts from 1940 to present.

It's exciting to see such growth. However, it's appropriate to put this growth in perspective (Figure 11). When we compare music cognition and music psychology to musicology, music theory, and ethnomusicology, we can see that the field is what the British would call "small beer."

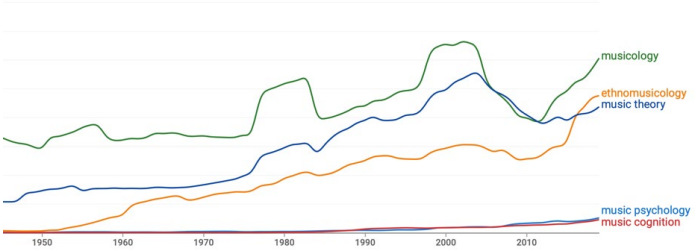

Figure 11: Relative frequencies of "music psychology" and "music cognition" compared with musicology, ethnomusicology, and music theory.

Within the broader realm of music scholarship, music psychology is a bit player. Moreover, that's also true in the world of psychological research: the psychology of music is a very small part of the modern field of psychology.

Apart from music psychology, a marginal status is also evident for the musical 'sciences' in general. In an article from 1885, the Austrian musicologist Guido Adler famously distinguished two main branches of music studies: historically-oriented music scholarship and a music science which he dubbed *systematische Musikwissenschaft* or "systematic musicology". Initially, systematic musicology included "comparative musicology" which later morphed into ethnomusicology and abandoned any affiliation with a science of music.

Today, systematic musicology is the one home-growth science within the world of music scholarship. But unlike the other subdisciplines of music scholarship, systematic musicology has been in long-term decline. When I was a student, there were three systematic musicology graduate programs in North America. All three are now closed.

In Europe—especially in German-speaking countries—we see that systematic musicology programs continue to exist, but the field as a whole is not thriving. Focusing on literature in German, Figure 12 suggests the field has been in decline after peaking at the turn of the century.

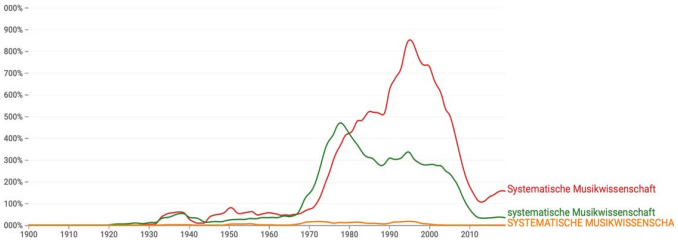

Figure 12: Relative frequency for the phrase "systematische Musikwissenschaft" in German texts from 1900 to present.

The sciences of music mostly thrive outside of music scholarship. It is psychologists, engineers, and computer scientists who are the principal torchbearers for a science of music.

I happen to love both science and the arts, so for me the culture wars have been simply dispiriting. But I am hopeful that, in the future, music scholarship will again warmly welcome empirical and scientific scholarship into the fold. But I'm aware that that will only happen if the research offers compelling insights that attract mainstream music scholars.

Reprise

So let me bring my presentation here to a close by offering some observations and some advice.

Over at least the past three centuries, music has become increasingly present in people's lives. Moreover, as we saw, even talking or writing about music has also become increasingly popular. Apparently, people hunger for information and ideas about music.

As musicians and music scholars, we surely want music to serve human well-being in as many ways as music is capable of doing that. However, from time-to-time, our zeal and enthusiasm for music can outstrip the evidence. Our task is neither to overestimate or underestimate music's capacities.

Even when we harbor the best of intentions, our intuitions can fail us. In fact, sometimes our intuitions can be counterproductive. Intuition is essential in life, but in matters of importance we are remiss if we don't aim for evidence-based practice.

If we want to change the world, we need to know that the changes we propose or make will have the intended effect. The only type of research that allows us to understand change is explanatory research whose aim is to identify causality.

There are many possible causal sources, so in conducting explanatory research we should cast a wide net by collecting multiple measures—spanning the biological to the cultural. In order to pursue a multi-measure approach, we need to be open to learning new methods and aim to collaborate with researchers who employ contrasting or complementary approaches.

There are real questions to be answered about music. The best music research starts with good questions in which the researcher then assembles the methods and tools that will help address that question. Questions should dictate methods rather than the other way around.

In this presentation, I've suggested that a particularly good question is: *What makes for a good musical culture*? It's certainly a thorny challenging question. But it's also an essential question that's worthy of our attention. It's a question that leads to a follow-up practical question: *How do we go about improving musical culture?* I've suggested in this presentation that this question is deserving of a central place motivating music scholarship. To the extent that musical culture is shaped by technology, commerce, legislation, and regulation, the public interest in culture requires engagement with the formation of pertinent policy.

I've suggested that if we care about the state of musical culture, then we need to invest in policy-related research. That is, we need to engage in the sort of policy research one finds in nearly every other department in the university academy. Specifically, we need to go beyond abstract political rhetoric, and focus on concrete suggestions for evidence-based legislative recommendations. In shaping future musical cultures, I propose that we need to develop an informed cadre of scholars who can act in the public interest.

Empirical music scholarship has shown considerable growth in recent decades. However, scientific and systematic approaches to music-research still represent only a small fraction of music-related scholarship. As we've seen, musicology's home-grown science of music—the field of systematic musicology—has struggled. Efforts by some arts and humanities scholars have done much to undermine confidence in science. As a result, it has been psychologists rather than music scholars, who have been at the forefront and leaders in music science.

Much of the misunderstanding can be traced to a problem of language. Many arts and humanities critics have rightly challenged scientific claims to truth. While scientific research is motivated by the aim or hope of attaining truth, truth cannot be established through empirical observation—something we've known since David Hume and philosophers of even earlier centuries. Practical science is not about truth, it's about evidence. It's about collecting and interpreting evidence. If we want to regain the respect of philosophers, we need to stop defending science by talking about truth. The proper way to defend science and scientific method is by talking about evidence and how evidence can make one narrative more plausible than another.

More important than the philosophical arguments, the most effective way to build interest in music science is by demonstrating its value. If we want empirical music research to be impactful, we need to address and solve musical problems. We need to produce stories that musicians and music scholars find compelling and interesting. Among other auspicious approaches, corpus studies appear to be especially promising.

If we want music research to be impactful: we need to keep focused on musical problems. We need to resist chasing after funding that supports tangential studies, in which musical concerns are sidelined. We need to embrace an integrated bio-psycho-socio-cultural approach. A full accounting of music is not possible by focusing solely on biology or psychology. Nor will we have a full account of music by limiting our work to social and cultural accounts.

Don't think of your discipline as your allegiance, think of it as your limitation.

There is room for poetic music scholarship in which scholars respond to art with imaginative interpretations. However, when the scholarship moves into the territory of knowledge claims, artistic inventiveness needs to step to-the-side and allow careful empirical testing to be front-and-center. We need to place more emphasis on hermeneutic and explanatory research over descriptive and poetic musicological scholarship.

One of the first methodological no-no's taught to both arts and sciences scholars is the illegitimacy of the *ad hominem* argument, where the attack focuses on people rather than ideas. As someone who has taught research methodology for more than two decades it has personally been disconcerting to see the recent explosion of personal attacks in the academic world. Let's stop talking about good and bad people, and instead focus on good and bad ideas.

There is much to learn about research methods; and it's important for every scholar not to be satisfied with what they were taught. Everyone needs to read widely beyond their discipline and look for methodological insights wherever you can find them. If you don't know what reification is, or the correlation/causality conflation, or if you don't recognize acquiescence bias, or don't know what counterfactual control is; if you can't recognize an *ad hominem* argument when you see one—then you're not as effective a scholar as you could be. Everyone needs to develop a healthy understanding of the innumerable ways by which research can go awry.

Methodology is not some sort of rationalist obsession. It is the way we pay tribute to our scholarly predecessors whose hard-won lessons include the discovery of yet additional ways where research can go wrong.

Having said all of that, BE HOPEFUL! I'm thoroughly convinced that music scholarship's best moments lie ahead. I think the future of music research is actually very rosy. I only wish I could be around for all those future discoveries. And with that, I thank you for your attention.

Questions and Answers

Bob Sturm: 1) What did the work of Mauch *et al.* show that wasn't already known from popular music studies? (Their paper makes some very strange claims.) 2) Do you think the kinds of features they extract (e.g. 12 MFCCs from 43 ms frames) from 30-second extracts

(which might not even be "representative") may mean they are not analyzing music at all?

David Huron: In my talk I highlighted those dates that people might recognize as interpretable: 1964, 1983, and 1991. First, notice that the magnitude of the three corresponding Foote similarity measures differ: the data suggests that the musical changes associated with the advent of Rap and Hip Hop are larger than for New Wave and Hard Rock, and are much greater than for the British Invasion. Also notice that there are lesser but noticeable moments of change around 1998 and 2000.

What's useful about a quantitative approach is that it makes it clear that there is a hierarchy to different musical changes: some are more important than others. A quantitative approach also alerts us to more subtle musical changes.

I agree that there are technical issues that mar this particular paper by Mauch *et al.* However, I think the general approach is inspiring. Future researchers will surely refine the methodology, and I expect historians will find it stimulating to interpret the various quantitative results.

Eric Elder: I'm curious to know more about how you define corpus content, or define your terms, as in your study with Horn. For example, it seems to me that highly successful American (at least) "light-Classical" composers—who accounted for the lion's share of sheet music—didn't make the cut in fitting into your definition of "art music." I'm thinking here of composers like M. L. Gottschalk or Basile Bares. How do we make decisions of definition and corpus content responsibly?

DH: I'm glad you phrased your question in terms of "responsibility." There's no such thing as an unbiased musical sample. At this point in our history, the main problem is not building unbiased corpora; the main problem is building any corpora at all. Everybody wants data, but in my experience very few researchers want to tackle the thankless job of assembling a corpus. Especially if assembling a corpus leads to charges of bias, there's even less incentive for scholars to do the necessary work.

Ironically, criticism itself can lead to even worse bias. Suppose I'm interested in Czech music and want to build an appropriate musical database. No matter what I include, of course, I'll be criticized for excluding composers X, Y, and Z. I can avoid such criticism, for example, by focusing just on the music of Smetana. No one can criticize me now because I can say my database is music by Smetana.

The danger here is we end up with corpora for individual musicians and avoid corpora representing national, stylistic, cultural, or period musics. That is, because of the fear of criticism, we're less likely to have corpora for Indonesian music, Hip Hop, Romani (gypsy) music, LGBTQ+ music, or 12th century Gregorian chant, and more likely to have corpora for Bach, Mozart, and Palestrina—which is indeed the case now.

Of course, we need to be vigilant about the biases attending any database. When we publish, we need to identify as best we can the limitations of any corpus we use.

In the case of the Horn and Huron study, the sampled composers were randomly drawn from two Wikipedia articles entitled "List of Classical-Era Composers" and "List of Romantic-Era Composers." Together, these articles list 860 composers. Gottschalk was included in the list from which we randomly selected composers, but not Bares.

If I were to offer advice, I would say: Do the best you can to have a clear definition of the population of interest; be as inclusive and representative as you can. But above all, please build a corpus!

As we gain experience building more musical databases, researchers will inevitably become more sophisticated in identifying and controlling various forms of sampling bias.

David Sherry: Has neuroscience research produced in the explanatory category of music research?

DH: When I was an undergraduate, I read quite a bit of basic hearing science with the hope that it might contribute to my understanding of music. It didn't help at all.

At least, that was the case for the first couple of decades of my career. But over time, connections emerged, and now we can see that there are important musical phenomena (like the high voice superiority effect) whose origins can be traced directly to the physiology of hearing.

In the case of neuroscience, I think we need to be similarly patient. I'm not a neuroscientist, but my understanding is that the cliché criticism is that neuroscience—more specifically brain imaging research—tends to point to anatomical correlates, sometimes using weak data, sometimes using suspect statistical procedures, while failing to inform us about the causal mechanisms—that is, offering explanations.

Neuroscience these days is mostly correlational rather than explanatory. But neuroscientists are smart people facing especially difficult problems. These are early days in our understanding of the brain. I expect it

will take a while before neuroscientists can remove the training wheels and really start moving ahead. My experience with studying hearing sciences I think offers a hopeful tale: we simply need to be patient.

I think it would be a grave mistake for a music scholar to assume that music can be understood without recourse to understanding the brain. That's a bad idea in the same way that ignoring culture is a bad idea.

Michael Schutz: Can you give examples of individuals in other fields who have been particularly successful in translating basic research into public policy? This seems like a very important challenge for us as music scholars.

DH: No. I don't know of anyone I could point to. It's more of a wish on my part for what I hope happens in the future.

Song Hui Chon: There must be some noise-related public policy and regulations based on acoustics and psychoacoustics (and medicine). Not exactly music-based research, but a closely related field.

DH: Good point.

Assaf Suberry: Isn't a good music policy advice will be to invest in music education? Not for its cognitive outcomes but for its cultural/moral or just because of the inner value of music making and listening.

DH: I agree. We don't need to promote music simply for its instrumental value. Music gives pleasure to billions of people, and unlike the pleasure of smoking, eating, alcohol, gambling, and other enjoyable activities, music is remarkably benign. Music has intrinsic value in people's lives apart from how it might be used for other purposes.

Christ Billy Aryanto: I want to ask regarding music training and cognitive abilities. Most past research measured musical training by years of music training only or self-report questionnaire. Do you think there is a problem of measurement objectivity so there is no strong relationship found between those variables?

DH: That's an interesting proposal. Your suggestion is that perhaps we haven't seen much cognitive transfer from musical skills because our measures of musical skill are poor. I suppose that's quite possible. That sounds like a good research project.

Laurie Heller: Any advice for psychology in particular?

DH: I have a great admiration for psychologists. I've interacted with a lot of scientists over my career, and the very best scientists I've encountered are not acousticians, biologists, or neuroscientists—they're experimental psychologists. They're generally the most knowledgeable about experimental design and statistics, and more careful in applying best-practices methodology. The only advice I can offer to psychologists is: keep doing what you're doing!

Courtney Hilton: You identified demonstrating 'value' of more scientific research as being key to better integrating it within the broader field of musicology. I think I agree. But, to play devil's advocate, what if the different fields have fundamentally incommensurate values (i.e., like what someone like Kuhn, in the philosophy of science, would describe as arising from fundamentally different research paradigms)? How optimistic should we be about achieving better integration.

DH: People do indeed disagree about values, but those disagreements usually aren't as irreconcilable as is commonly supposed. Philosophers have noted that Kuhn's concept of "incommensurability" is overstated. In the real world, people don't have trouble trading apples for oranges. The key is conversation.

I think we'd be surprised at how readily folks from different backgrounds would come to some basic agreements about shared values, even if some disagreements persist. I think much of the problem arises because there's no conversation going on. When it comes to values, people tend to want to be affirmed rather than informed. It helps a lot to talk directly with people you think of as the enemy.

Byan Bell: What other research methods do you think are promising besides corpus studies?

DH: The gold standard for empirical research is still the double-blind controlled experiment. As I've argued elsewhere, what we really need is a lot more sensitive and mindful cross-cultural experimental research.

Sarah Sauve: Perhaps I'm misunderstanding the context, but as a predominantly Western and white researcher field, how can we fairly define what a "good musical culture" looks like?

DH: Yes, it would be a grave mistake not to cast a wide net when considering what makes a good musical culture. Once again, I think conversation is the key. We will learn to identify good musical cultures only through experience, debate, and interaction.

Incidentally, there's precedent for this with various research efforts to measure general human well-being. You know, for decades, governments have tended to rely on GDP—gross domestic product—as an index of a nation's well-being. GDP has a certain utility, but its deficiencies have also been long recognized, not least by economists themselves. When GDP is used to shape social policy, there is plenty of opportunity for mischief.

Can we come up with a better index of human well-being?

You probably know the story about what happened in Bhutan when the King there voiced his dissatisfaction with GDP and instead said that his policies would be oriented to maximizing what he called Gross National Happiness. Over the past three decades or so, dozens of new measurements have been devised to better estimate human well-being—like the Med Jones Gross National Well-being index, the Oxford Poverty and Human Development Initiative, the Multidimensional Poverty Index, the Gallup-Healthways Well-Being Index, and the OECD Better Life Index. And probably the best known of these measures is the United Nations Human Development Index.

Of course, none of these measures is perfect. But as we gain experience and input from lots of different people, these sorts of measures do, I think, help us better understand various implicit or explicit human values. When decisions are made on the basis of these more refined indices, we have the potential to better tailor policies and regulations so as to increase their benefits.

My aim here isn't to define "good musical culture." My aim is simply to raise the concern and to encourage research in this area. In my own career I've done no policy-related research at all. It's only since I retired that I've really thought about the state of music research in general and what we haven't been doing that we ought to be doing. And my conclusion is that we haven't been attending to an important part of our research mission: nurturing the sort of musical culture that best contributes to human well-being.

Niels Christian Hansen: If corpus studies hold the promise for future scholarship, it becomes key for us to identify and/or create the best corpora. I'm curious what your favorite corpus is? And how do we go about identifying and creating optimal corpora in the future?

DH: I'm not sure I have a favorite corpus because they're all flawed in various ways. I suppose I'm partial at the moment to a cross-cultural sample of melodic transcriptions we created recently based on the French Ocora and the Smithsonian Folkways collections. It's a symbolic rather than an audio corpus. It's far from ideal, but it's a real effort to create a musical database that draws on a range of musics from around the world. Unfortunately, it needs to be bigger.

How do we go about creating optimal corpora for future research? That's a great question, but I'm afraid that would require a very lengthy response. There are just so many considerations, so I'll pass on answering that for now.

Juan Pablo Vigneaux: Could you elaborate a bit on the role of psychology and cognitive science in future music research and to what extent this line of work might be relevant to general musicologists? What are the future perspectives of those approaches? (I'm trying to distinguish them from the sort of data analysis methods applied to corpus studies and to the public policy recommendations.)

DH: In retrospect, I guess my presentation has unduly emphasized my enthusiasm for corpus studies and policy research. Many of the questions I posed in my talk are essentially psychological in character. For example, can a person listen to too much music? How does music evoke emotions in listeners? Can music somehow corrupt or enhance moral behavior? Is background music bad for you? These are questions that can't be answered through corpus studies, but they are questions that can be addressed through experiments. Surely, much of the most informative music research in the future will be psychological.

Pauline Larrouy-Maestri: You say "what is a good music culture?" and "how to improve musical culture?" are good questions. Can you tell us more about what you mean by "good" in this context?

DH: As I mentioned earlier, my aim is really to start a conversation rather than to propose specific solutions. But I understand that it would be helpful to have some idea of the sorts of values one might imagine characterizing a good musical culture. So in general, what I mean by "good" is something that contributes to human well-being. That can be cached out in various ways, including better prospects for employment opportunities for musicians, better opportunities for amateur music-making, greater freedom of musical access for listeners, musical experiences that people find meaningful and rewarding, music that contributes to mental and physical health, and a culture that encourages people to be respectful and understanding of folks different from themselves. How's that for a start?

William O'Hara: How might music departments embrace the public policy agenda you describe? Researchers pivoting to new areas? Interdisciplinary collaborations? New grad/undergrad degree programs, etc.?

DH: It would require leadership at the level of department heads or directors. It's going to be challenging because currently I don't know of any scholar who does cultural policy research in music. So even if a department head or director wanted to hire such a person they're going to find it difficult to find someone. I suppose one might begin by arranging one

or more conferences related to public policy in musical culture and see what happens. Lots of people have musical backgrounds, so perhaps there's an existing scholar in economics, law, or government programs who could be inspired to focus on this topic. In the end, I suspect that an existing music industry program might be encouraged to expand its offerings and hire someone in the area.

Eric Clarke: My question relates to what you characterize as poetic investigation and in particular to the relationship between practice-as-research and explanatory research. Arguably, David Sudnow's 1978 book 'Ways of the Hand' is close to the former, but perhaps help to for instance Jonathan De Souza's 2017 'Music at Hand'. So is there really such a gulf between them as your presentation might have seemed to suggest?

DH: I recall loving Sudnow's 'Ways of the Hand' and his later book 'Talk's Body.' Although Sudnow's writing is wonderfully poetic, in my taxonomy, I'd characterize it primarily as phenomenological and so descriptive. He's describing in intimate detail his personal subjective experience. And that's grist for the mill for trying to interpret and understand it. So I think it feeds pretty directly into the later, more analytic work, such as De Souza's work on idiomaticity.

Aditya Chandler: Given how little consensus there is on the best approach to music studies, how do you approach communicating your findings in an engaging way with those who may not have the expertise or trust in empirical, explanatory work that you have?

DH: Many people (myself included) are interested in making the world a better place. That is, we'd like to bring about certain changes. Causal ("how" and "why") accounts should be inherently more interesting to us because explanatory accounts offer opportunities to effect change. (If you don't believe there are knowable causes, then you can't change the world except by accident.) So for people who want to change the world, explanatory work should already be intrinsically more engaging.

Secondly, there is something captivating about evidence. Like a good detective story where the missing fireplace poker means the butler couldn't have perpetrated the crime, explanatory research often assembles evidence that people will find absorbing, forceful, and compelling. There is something satisfying about a persuasive argument.

Yes, there are times when we are offended by explanatory accounts because they feel too deterministic. All you can do is talk about it.

Logan Rutledge: I feel as though some poetic music theory papers deal more strongly with Gender Studies, Critical Race Theory, LBTGQIA+ Studies, etc. (For example, Marianne Kielian Gilbert's work on Nina Simone and Miriam Gideon). Is it possible that while poetic papers might be more based on personal observation creating a paper embedded in subjectivity, the interdisciplinary and cultural depth and meaning is more significant and thus is important in moving legislation through affect?

DH: There's a lot here in your question to talk about. Let me pick up on just one thread.

There's a long history of debate about whether change is best achieved through logical argument or by emotional appeals. I suppose the division between Art and Science reflects these two different aspects of who we are. The cliché is that Art appeals predominantly to feeling whereas Science appeals predominantly to our sense of rationality.

I think it's important to recognize the limits of both approaches. You can't debate what people feel, but sometimes the feelings people experience arise from misunderstanding a situation. On the other hand, logical arguments can be devoid of moral or aesthetic value. I'm not ready to give up, either on the value of human emotions, nor the value of rationality. Or said another way, I love both art and science.

Lydia Snyder: I found the study on changes in musical elements across time fascinating. Has there been any studies like this done in other cultures?

DH: None that I know of. I'd encourage young scholars to consider pursuing more such studies and, as you suggest, to broaden the mandate to study all of the world's music-making.

Anonymous Attendee: What advice would you give to a university music student who aspires to conduct research in music cognition, but lives in an area in which music cognition is not offered in many universities? How does one pave the way for music cognition in a university where there is currently no program?

DH: First, I sympathize with people who don't have access to the same resources as others do. It's an unfortunate if perennial problem.

Of course when I was a student (many years ago) there were no music cognition programs in existence. In my case I thought the study of music needed to be more than simply the study of music history. For both my undergraduate and masters' degrees I enrolled in interdisciplinary programs that allowed me greater freedom to pursue different things. I took courses in music. But I also took courses in acoustics, psychology,

computer science, philosophy, aesthetics, history, physiology, and sociology. Apart from the coursework, I did a lot of reading, predominantly in music, but later in cognitive sciences.

If you're hoping to do an advanced degree related to music cognition, most programs are looking for students who have strong backgrounds in both music and science.

Bryan Bell: Of the "big questions" you listed at the beginning of your talk, which questions do you think are most pertinent to music research now?

DH: I think there are a number of interesting questions related to the flexibility or plasticity of human musical hearing. For example, music theorists have long argued that good musical analyses change the way people experience the music. These claims need empirical support. That is, I think a worthwhile area of future research would address questions like: Are there different ways of "listening?" And with training or effort, how differently might we be able to hear music?

Similarly, questions arise from our engagement with world music and cultural difference. For example, to what extent can we hear or understand the music of another culture in the same way as people from that culture do?

It would be interesting to know whether different musical preferences relate to different ways of hearing. For example, I'm not a fan of Heavy Metal. So why not? Is there something about the way I listen—my listening habits, my personality, my cultural background—that prevent me from appreciating this genre? And, of course, I favor the question: What makes a good musical culture?

Eleonora Beier: Given the importance of focusing future research on applied questions, do you think there is still value to basic research about the cognitive/neural mechanisms of music even if it does not provide obvious applications to policy and society?

DH: Absolutely. For two reasons. First, there's a long history of tangential research bearing unexpected fruit. I think of basic research as second-order pragmatic research.

The second reason is more important. The most important resource any researcher has is her or his passion. Without passion, there's little motivation to work on problems. You're going to be your most productive as a scholar if you are doing things you're passionate about. If you're passionate about doing applied research, then do applied research. If you're passionate about doing basic research, then do basic research. Also, don't be afraid to change your research focus. Your interests are apt to change over the course of your career. Following your passion is key to maintaining your enthusiasm and productivity.

Michael Schutz: The findings of Mauch *et al.* (2015) regarding changes over music history are fascinating. At the same time, seeing that I can't help but be reminded of your example of tendencies to construct stories after the fact. There is a great example in the "American Soldier" survey looking at how we can easily generate explanations for nearly any outcome of complex data. Nearly any outcome of "what predicts success as a soldier" sort of seems right when you think about it (I think I learned this from your workshop!).

How do we guard against this kind of post-hoc explanation for what could (in theory) be artifacts of complex statistical analyses. In other words, if the dips had come in different years, could we not have come up with musical/cultural events happening around then that might (*might*) explain them? Music is so complex, this seems like a real danger.

DH: As you rightly note, the best research posits *a priori* hypotheses and then tests them. *Post hoc* accounts aren't nearly so convincing. I liken *a priori* hypothesis testing to guessing what's inside a box and then opening the box to see if you're right. In *post hoc* research, you open the box, and then tell everyone what's inside. Clearly, *a priori* research is more compelling because the researcher better invites failure.

But *post hoc* or exploratory research also has an important role. There are plenty of cases where you don't have a clue what's inside the box, and so you have little choice but to open it up and have a look. Especially in novel fields where we don't yet have any good theories or intuitions, *post hoc* or exploratory research is the only viable approach.

As you note, in corpus studies there's a real danger in conducting exploratory research when the corpus represents a complete population of interest. In this case, a *post hoc* approach amounts to opening all of the boxes. That's not good because it preempts the possibility of doing later *a priori* hypothesis testing. If you're interested, I've written about this in a 2013 paper entitled "On the virtuous and the vexatious in an age of big data."

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[1] The text for this article is based on the inaugural keynote address for the Future Directions of Music Cognition International Conference, delivered online on February 22, 2021.